



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005TX200B

Title: A Decision Support system to Develop Sustainable Groundwater Management Policies for a Multi-county Single Aquifer System

Project Type: Research

Focus Categories: Groundwater, Models, Management and Planning

Keywords: groundwater policy, sustainable yield, game theory

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Federal Funds: \$5,000

Non-Federal Matching Funds: \$21,150

Congressional District: 15th

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Abstract

This research will assist efforts to develop a decision support framework for sustainable groundwater management in a South Texas region. Counties within the study region (Bee, Dewitt, Goliad, Refugio, and Victoria) share the central portion of the Gulf Coast Aquifer. However, this portion of the aquifer is regulated by separate and independent groundwater districts. In the case of Victoria County, no groundwater district is present. The interconnected nature of the aquifer necessitates that groundwater districts be aware of activities and programs in neighboring counties. This project will develop a transparent decision support system to assist groundwater conservation districts in the formulation and evaluation of county-level groundwater management plans. The project team will work with an alliance of groundwater districts in the region to investigate such issues (among others) as the mining of shallow wells, effects of groundwater levels on baseflows, and the potential for salt water intrusion to occur if overpumping occurs. Game theory will be used to simulate how individual groundwater district managers react to proposed policies and strategies, and subjective information will be gathered about the

preferences and risk tolerance of groundwater district personnel. Data from the game theory exercises will initially be used in a steady-state model as well as through the use of a multi-temporal modeling framework. Results of the project will provide important insights about the extent to which how groundwater policies developed in one county may affect neighboring districts and how cooperation and collective management of a shared groundwater resource can be cultivated.